

ICORD (International Collaboration On Repair Discoveries)
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Biographical data

Full Name: STEEVES, John Douglas
Present Rank: Professor
Place of Birth: Calgary, Alberta
Date of Birth: March 25, 1952
Citizenship: Canadian

Education

Undergraduate:
University of Manitoba 1970-1973 B.Sc. (Zoology/Psychology)

Graduate:
University of Manitoba 1974-1978 Ph.D. (Neuroscience/Physiology)

Academic awards and distinctions (prior to final degree):
1978, Best Thesis Award, Department of Physiology, U. of Manitoba

Professional employment record

Positions held prior to the University of British Columbia (UBC) appointment:

1978-79 Post-doctoral Fellow, University of Alberta, Dept. of Physiology
(Supervisor: Dr. Keir Pearson)

Date of first appointment at The University of British Columbia: July 1, 1979

Rank at which first appointed: Assistant Professor

Subsequent ranks including dates of promotion:

Associate Professor - (1985-92) Department of Zoology and Graduate Program in Neuroscience
Associate Member - (1987-) Department of Anatomy, Faculty of Medicine
Professor - (1992-) Department of Zoology and Graduate Program in Neuroscience
Associate Member - (1995-) Department of Surgery, Faculty of Medicine
Director - (1995-) CORD (Collaboration on Repair Discoveries)
Coordinator/Assoc. Dean - (1996-99) External Relations, Faculty of Science, UBC

John and Penny Ryan BC Leadership Chair (2002-) \$6.0 million endowed position

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Date of granting of Appointment Without Term: July 1, 1984**Principal University and Department teaching and service responsibilities:***Teaching:*

Year	Course	Enrollment	Contact Hours
1984-96	Biol. 353 Vertebrate Physiology	300/year	30 hr/yr
1984-96	Biol. 354 Environmental Physiology	100/year	30 hr/yr
1984-94	Biol. 455 Comparative Neurobiology	60/year	40 hr/yr
1984-	Biol. 448 Directed Studies	~1/year	50 hr/yr
1984-	Biol. 449 Undergraduate Honors Thesis	~1/year	50 hr/yr
1987-89	Anat. 425/Phyl. 425 Neuroanat./Neurophysiol. (Medicine)	140/year	50 hr/yr
1987-89	Anat. 510 Advanced Neuroanatomy (Medicine)	15/year	50 hr/yr
1984-89	Zool. 500 Directed Studies (Graduate course)	~1/year	50 hr/yr
1990-95	Neurosci. 500/501 (Graduate courses in Neuroscience)	20/year	80 hr/yr
1995-98	Director, Neurosci. 501 (Graduate course in Neuroscience)	20/year	80 hr/yr
1998-2000	Interdisciplinary Science 333 (artificial & bio. control systems)	30/year	50hr/yr

Departmental Service:

Member, Search Committee, Dept. of Zoology, UBC (for developmental biologist; Dr. H. Brock), 1981
 Member, Search Committee, Dept. of Zoology, UBC (for molecular biologist; Dr. D. Moerman), 1986
 Member, Search Committee, Dept. of Zoology, UBC (for evolutionary ecologist; Dr. D. Schluter), 1989
 Member, Search Committee, Dept. of Zoology, UBC (for cell biologist; Dr. L. Matsuuchi), 1990
 Chair, Search Committee, Dept. of Zoology, UBC (for NSERC Women's Faculty Award; Dr. V. Auld), 1991
 Chair, Search Committee, Dept. of Zoology, UBC (for spinal cord regeneration biologist; Dr. W. Tetzlaff), 1994
 Chair, Search Committee, Dept. of Zoology, UBC (for endocrinologist; Dr. C. Airriess), 1996
 Chair or Member, Several Tenure and Promotion Review Committees, Dept. of Zoology, UBC

Member, Supervisory Committees of over 100 graduate students (1979-)
 Supervisor, Dept. of Zoology Histology Facility (1979-85)
 Coordinator, Dept. of Zoology "Physiology Group" Seminar Series (1981-83)
 Member, Dept. of Zoology Undergraduate Program Committee (1985-87)
 Member, Dept. of Zoology Future Planning & Priorities Committee (1985-90)

Member, Dept. of Zoology Executive Council (1991-)
 Member, Dept. of Zoology Common Facilities and Technical Staff Committee (1991-96)
 Member, Dept. of Zoology Graduate Committee (1991-96)
 Chair, Dept. of Zoology Graduate Curriculum Revision Committee (1991-96)
 Chair, Dept. of Zoology Research Development Committee (1996-98)

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University Service:

Member, Faculty of Science, Outreach Committee (1985-90)
Member, Faculty of Science, Computing Committee (1986-88)
Coordinator, Neuroscience Discussion Group Seminar Series (1982-86)
Chair, Graduate Program in Neuroscience, Curriculum Committee (1988-90)

Member, Graduate Program in Neuroscience, Advisory Committee (1984-96)
Member, Graduate Program in Neuroscience, Admissions Committee (1984-96)
Representative from Faculty of Science to Faculty of Medicine (1988-90, 1991-)
Member, Biotechnology Laboratory Tenure and Promotions Committee (1993-96)
Member, Coordinating Committee, UBC Brain Research Center (1995-97)
Member, Various University Committees concerned with International Students (1997-2000)

Director (1995-) ICORD (International Collaboration on Repair Discoveries)

Number of members affiliated with ICORD Research Group = 195

Total of endowments already raised in support of ICORD (1995-2002) > \$18 million

See also ICORD Website: <http://icord.org>

Coordinator / Assoc. Dean (1996-99) External Relations, Faculty of Science

(included undergraduate cooperative education program, industry liaison, faculty fund development, and international students)

Community Service:

Various lectures on "Brain and Behaviour" and "Spinal Cord Injuries" to a number of Vancouver public groups (1979-)

Interviews with local, national and international media on "spinal cord injuries and repair" (1986-)

Chair, National Steering Committee for the Rick Hanson Institute for the creation and supervision of Neurotrauma Funds in each Canadian Province (1995-); Total funds raised as of 1997 > \$35 million over 5 years (however, \$2 million/yr perpetual neurotrauma fund established under legislation for the Province of BC).

Record of leaves of absence (indicate dates, duration, type of leave, and whether paid or unpaid):

September 1989-August 1990 - sabbatical study leave

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Professional Activities

Membership in professional and learned societies (including offices held, committee memberships, etc.):

- Canadian Society of Zoologists (CSZ)
- Canadian Federation of Biological Sciences (CFBS)
- International Brain Research Organization (IBRO)
- Society of Neuroscience (SN)
 - President (BC Chapter) 1982-86
- Canadian Association for Neuroscience (CAN)
 - Executive Council Member 1984-87
- International Neurotrauma Society
 - Member, Organizing Committee for Third International Symposium in Toronto, 1995
- International Society of Developmental Neuroscience (ISDN)
 - Executive Council Member, 1997-
 - Chair, Local Organizing Committee and Host for 12th Biennial Meeting of ISDN in Vancouver, BC, August 1998
 - Secretary General, 2002-
- Rick Hansen Spinal Cord Injury (SCI) National Network (SCI-Net)
 - Director, 2002-

Academic or professional awards and distinctions:

- Finalist for selection to Canadian Astronaut Program, 1983
- Izzak Walton Killam Memorial Faculty Research Fellow (1989-90)
- Grass Foundation Travelling Lecturer (Society for Neuroscience), 1991
- Australian Society for Neuroscience Annual Meeting Plenary Lecture, 1999
- Fifth Paralympic Scientific Congress Plenary Lecture, 2001
- John and Penny Ryan BC Leadership Chair, 2002 (\$6.0 million endowment)

Professional service and experience (consultancies, professional committees, commissions, visiting professorships, invited lectureships, etc.):**Invited Lectures:**

- 1978 Georgetown Univ. (Dept. of Anatomy), Washington, DC, USA
- 1979 Univ. of Alberta (Dept. of Physiology), Edmonton, Alberta, Canada
- 1980 Univ. of Washington (Dept. of Physiology & Biophysics), Seattle, Washington, USA
Univ. of Manitoba (Dept. of Physiology), Winnipeg, Manitoba, Canada
Simon Fraser Univ. (Dept. of Kinesiology), Burnaby, BC, Canada
- 1981 UBC (Dept. of Physiology), Vancouver, BC, Canada
- 1983 UBC (Dept. of Zoology), Vancouver, BC, Canada
- 1984 Emory Univ. (Dept. of Physiology), Atlanta, Georgia, USA

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- Univ. of Southwestern Louisiana (Dept. of Biology), Lafayette, Louisiana, USA
Louisiana State Univ. (Dept. of Zoology & Physiology), Baton Rouge, Louisiana, USA
- 1985 Univ. of Hong Kong (Dept. of Zoology), Hong Kong
Jinan Univ. (Dept. of Biology), Guangzhou, China
Zhongshan Univ. (Dept. of Biology), Guangzhou, China
Guangzhou Physiological Society, Zhongshan Medical College, Guangzhou, China
Simon Fraser Univ. (Dept. of Kinesiology), Burnaby, BC, Canada
- 1986 Univ. of New England (Dept. of Physiology), Armidale, NSW, Australia
Univ of Sydney (Dept. of Physiology), Sydney, NSW, Australia
Queensland Univ. (Dept. of Physiology), Brisbane, Australia
Princeton Univ. (Dept. of Biology), Princeton, NJ, USA
- 1987 UBC (Dept. of Pharmacology), Vancouver, BC, Canada
- 1988 UBC (Dept. of Neurology), Vancouver, BC, Canada
- 1989 Univ. of Manitoba (Dept. of Physiology), Winnipeg, Manitoba, Canada
Univ. of Washington (Friday Harbor Laboratories), Friday Harbor, Washington, USA
- 1990 Univ. of Alberta (Dept. of Anatomy and Cell Biology), Edmonton, Alberta, Canada
Univ. of Calgary (Dept. of Medical Physiology), Calgary, Alberta, Canada
Wake Forest Univ. (Dept. of Anatomy), Winston-Salem, North Carolina, USA
Emory Univ. (Depts. of Anatomy, Physiology, and Biology), Atlanta, Georgia, USA
- Univ. of Florida (Dept. of Neurosurgery), Gainesville, Florida, USA
National Institutes of Health (Lab. of Neural Control), Bethesda, Maryland, USA
Univ. de Montreal (Center for Neurological Sciences), Montreal, Quebec, Canada
McGill Univ. and Montreal General Hospital (Dept. of Neurology), Montreal, Quebec, Canada
- 1991 UBC (Depts. of Physiology and Zoology), Vancouver, BC, Canada
Queen's Univ. (Dept. of Physiology), Kingston, Ontario, Canada
Univ. of Louisville (Depts. of Neurosurgery and Orthopaedics), Louisville, Kentucky, USA
Tsukuba Univ. (Depts. of Anatomy and Physiology), Tsukuba, Japan
Iwate Medical School (Dept. of Anatomy), Morioka, Iwate, Japan
Yokohama City Univ. (Dept. of Biology), Yokohama, Japan
Kobe Univ. (Dept. of Anatomy), Kobe, Japan
- 1992 Univ. of Missouri (Depts. of Biology and Physiology), Columbia, Missouri, USA
Washington Univ. (Dept. of Biology), St. Louis, Missouri, USA
Univ. of Texas at San Antonio (Dept. of Surgery), San Antonio, Texas, USA
Univ. of New Mexico (Dept. of Anatomy), Albuquerque, New Mexico, USA
- 1993 UBC (Dept. of Neurology), Vancouver, BC, Canada
Yokohama City Univ. (Dept. of Biology), Yokohama, Japan
Tsukuba Univ. (Dept. of Anatomy), Tsukuba, Japan
Shiga Univ. (Dept. of Surgery), Otsu, Japan
Kyoto Univ. (Dept. of Surgery), Kyoto, Japan
Keio Univ. (Dept. of Anatomy), Tokyo, Japan
Univ. of Ottawa (Dept. of Physiology), Ottawa, Ontario, Canada

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- Amgen Incorporated (Neuroscience Biotechnology Division), Thousand Oaks, California, USA
 Univ. of California at Los Angeles (Dept. of Kinesiology), Los Angeles, California, USA
- 1994 Univ. of Zurich (Dept. of Neuroscience), Zurich, Switzerland
 Swiss Federal Institute of Technology (Dept. of Neurobiology), Zurich, Switzerland
 Univ. of Konstanz (Dept. of Biology), Konstanz, Germany
 Max Planck Institute for Psychiatry (Dept. of Neurobiochemistry), Martinsried (Munich), Germany
 Univ. of Manitoba (Dept. of Anatomy), Winnipeg, Manitoba, Canada
 Okanagan University College (Div. of Sciences), Kelowna, BC, Canada
 McGill Univ. (Dept. of Neurology), Montreal, Quebec, Canada
- 1995 Univ. of Arkansas (Dept. of Anatomy), Little Rock, Arkansas, USA
 Medical College of Pennsylvania (Dept. of Anatomy), Philadelphia, Pennsylvania, USA
- 1996 Univ. of Cambridge (Brain Repair Centre), Cambridge, England
 National Institute for Medical Research (Div. of Neurobiology), Mill Hill, London, England
 Kyoto Univ. (Dept. of Integrative Brain Science), Kyoto, Japan
 Keio Univ. (Dept. of Physiology), Tokyo Japan
 Tokyo Women's Medical College (Dept. of Neuroscience), Tokyo, Japan
 Yokohama City Univ. (Dept. of Physiology), Yokohama, Japan
- 1997 Univ. of Hong Kong (Dept. of Anatomy), Hong Kong, China
 Univ. of Miami (Miami Project to Cure Paralysis), Miami, Florida, USA
 Memorial Univ. of Newfoundland (Div. Basic Med. Sci.), St. John's Nfld., Canada
- 1998 National Univ. of Singapore (Dept. of Biology), Singapore
 University of Buenos Aires (Developmental Neurology and Disorders), Buenos Aires, Argentina
 Weizman Institute (Michal Schwarz), Rehovot, Israel
- 1999 United Arab Emirates (UAE) University (Faculty of Medicine), Al Ain, U.A.E.
- 2000 University of California at Irvine, Reeve-Irvine Center, Irvine, California.
 University of Auckland, Department of Physiology, Auckland, New Zealand.
 Australian National University, Canberra, Australia.
 Neurotrauma Day, Canadian Brain Injury Conference, Vancouver, BC.
- 2002 HPC (Hospital Privado de Cordoba), Cordoba, Argentina
 Neuro-regeneration Group, University of Western Australia, Perth, Australia
- 2003 Medarex Inc. New York, NY, USA
 IBM, Vancouver, BC, Canada
 University of Melbourne, and Howard Florey Research Institute, Melbourne, Australia
- 2004 UBC (Department of Neurosurgery/Neurology), Vancouver, BC, Canada.

Invited Conference Symposia or Workshop Lectures:

- 1976 Neural Control of Locomotion Symposium, Valley Forge, Pennsylvania
- 1985 Neural Control of Vertebrate Locomotion, Stockholm, Sweden

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- 1987 Canadian Paraplegia Association Annual Meeting, Vancouver, BC, Canada
- 1990 American Association of Anatomists, Philadelphia, Pennsylvania
Neuroscience Network Workshop (Spinal Cord), Winnipeg, Canada
Spinal Cord Development and Plasticity International Symposium, Columbus, Ohio, USA
- 1991 Neuroscience Network Workshop (Glia), Montreal, Canada
Neuroscience Network (Growth Associated Proteins), Calgary, Canada
International Brain Research Organization (IBRO), Development, Plasticity and Regeneration in the Spinal Cord: Cellular and Molecular Interactions (satellite symposium), Quebec City, Canada
Descending CNS Influences on Motor Function, Third International Congress of Comparative Physiology and Biochemistry. Co-organizer and speaker at a symposium (in 2 sessions): A) Visceral Motor Function, and B) Locomotion, Tokyo, Japan
Grass Foundation Lecture, Queen's Univ., Kingston, Ontario, Canada
- 1992 Fifteenth Annual Meeting of the Midwest Neurobiologists, Columbia, Missouri, USA
- 1993 Neuroscience Network and Annual Meeting (Inhibitory Molecules Theme Workshop), Montreal, Canada
Royal College Speaker at the 33rd Annual Canadian Association of Neuropathologists Meeting, Whistler, BC, Canada
Canadian Paraplegia Association Annual Meeting, Winnipeg, Canada
Fifth International Symposium on Neural Regeneration, Monterey, California, USA
- 1994 International Spinal Research Trust (ISRT) Conference on Strategies for Spinal Cord Repair, Bermuda
American Paraplegia Society 40th Annual Meeting, Las Vegas, Nevada, USA
Neuroscience Network Annual Meeting (Inhibitory Molecules Theme Workshop), Toronto, Canada
- 1995 Neuroscience Network Workshop (Functional Regeneration and Inhibitory Molecules), Co-organiser, Chair and Speaker, Montreal, Canada.
Neuroscience Network Annual Meeting (Inhibitory Molecules Theme Workshop), Chair, Montreal, Canada
Third International Neurotrauma Symposium, Chair and Speaker, Toronto, Canada
Neuroscience Network Workshop (Astrocytes), Chair, Montreal, Canada
First Annual Frontiers in Spinal Cord Research Symposium, Louisville, Kentucky, USA
- 1996 Eighth Annual Spring Conference on Brain and Behaviour, Fernie, BC, Canada
Tissue Culture Course in Neurobiology, Saskatoon, Canada
Fourth International Altschul Symposium: Cell Biology and Pathology of Myelin, Saskatoon, Canada
- 1997 Frontiers of Myelin Biology and Demyelinating Disease, Mystic, Connecticut, USA
Canadian Paraplegia Association Annual Meeting, St. John's, Newfoundland, Canada
- 1998 New York Academy of Sciences, New York, NY, USA
Chair and Speaker at International Conference on Latest Advances in Spinal Cord Injury Research (hosted by Christopher Reeve), Charlottesville, Virginia, USA
FASEB Conference on Neuroimmunology, Portland, Oregon, USA
Chair of Local Organizing Committee and Speaker, 12th Biennial Meeting of International Society of Developmental Neuroscience (ISDN), Vancouver, Canada
Fifth Congress of the International Union of Biochemistry and Molecular Biology (IUBMB), Jerusalem, Israel

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- 1999 Plenary Lecture to the Australian Neuroscience Society Annual Meeting, Hobart, Australia
Chair and Speaker at International Spinal Research Trust Annual Meeting, London, England
- 2000 Gordon Research Conference on Myelin, Lucca, Italy
Thirteenth Biennial Meeting of the International Society of Developmental Neuroscience, Heidelberg, Germany
Fifth Paralympic Scientific Congress, Sydney, Australia
International Spinal Research Trust Annual Meeting, London, UK
Second Annual Asia Pacific Symposium on Neural Regeneration, Xi'an, China.
- 2001 International Symposium on Spinal Cord Trauma: Neural Repair and Functional Recovery, Montreal, Quebec, Canada
International Symposium on Spinal Cord Trauma: Neural Repair and Functional Recovery, Montreal, Canada
BioFinance, Toronto, Ontario
Pacific Coast Brain Injury Conference, Whistler, BC.
Chair, International Symposium on Neural Regeneration, Asilomar, USA
- 2002 Fourteenth Biennial Meeting of the International Society of Developmental Neuroscience, Sydney, Australia
Biocontact Symposium, Quebec City, Canada
Annual Meeting of the Argentine Society for Neurochemistry (SAN), Cordoba, Argentina
Third Asia Pacific Symposium on Neural Regeneration, Perth, Australia
- 2003 IMHA (Institute of Musculoskeletal Health & Arthritis) Meeting of CIHR, Calgary, AB
NINDS Workshop (Translating Promising Strategies for Spinal Cord Injury Therapy Workshop, Bethesda, MD, USA
American Association of neurological Surgeons (AANS), San Diego, CA, USA
Nano-Health/Nano Medicine Workshop, Montreal, Canada.
ASIA (American Spinal Injury Association) Annual Meeting, Miami, FL, USA
Sixth International Spinal Research Trust, London, England
International Spinal Cord Society (ISCoS), Beijing, China
Chair, International Symposium on Neural Regeneration, Asilomar, USA
- 2004 CPS (Canadian Physiological Society) Meeting, Vernon, BC
ISSICON (International Spine & Spinal Injuries) Conference, New Dehli, India
Spinal Cord Injury Workshop, Hong Kong, China
AANS American Association of Neurological Surgeons) Annual Meeting, Orlando, FL, USA
ISN (International Society for Neurochemistry) 6th Advanced School of Neurochemistry, Avignon, France
CCNS (Canadian Congress of Neurological Sciences) 39th Meeting, Calgary, AB
APSNR (Asia Pacific Symposium on Neural Regeneration) Conference, Osaka, Japan
ICCP (International Campaign for Cures for Spinal Cord Injury Paralysis) Conference, Vancouver, Canada

Visiting Professorships:

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1985 (March-May) Jinan and Zhongshan Universities (Depts. of Biology and Physiology), Guangzhou, People's Republic of China

1990 (January-February), Univ. of Alberta (Dept. of Anatomy and Cell Biology), Edmonton, Alberta

1993 (February) Yokohama City Univ. (Dept. of Biology), Yokohama, Japan

1996 (December) Yokohama City Univ. (Dept. of Biology), Yokohama, Japan

Other Professional Service:

Member, Editorial Advisory Board for Brain Research Bulletin (1994-)

Member, Editorial Advisory Board for International Journal of Developmental Neuroscience (1997-)

Referee for numerous scientific journals (eg. Science, Nature, J. Neurosci., Brain Res. Bull., Exp. Brain Res., Exp. Neurol., J. Neurophysiol., Neuroscience, J. Comp. Neurol., Brain Res.)

Referee for various government agencies and foundations (eg. MRC, NSERC, Alberta Heritage Foundation, Manitoba Health Research Foundation, NIH, NSF, Rick Hansen Man-in-Motion Foundation, Neurotrauma Fund)

Member, Neuroscience Network (1990-98)

Theme Coordinator, Inhibitory Molecules Theme, Neuroscience Network (1994-98)

Member, Advisory Council of Neuroscience Network (1994-98)

Host and Organizer, Neuroscience Network Annual Meeting (1997)

Chair, National Advisory Panel for the Canadian Neurotrauma Initiative (1996-)

Host and Organizer, 12th Biennial Meeting of the International Society for Developmental Neuroscience (1998)

Member, Executive Council of International Society for Developmental Neuroscience (1998-)

Member, Advisory Panel of the International Spinal Research Trust (1998-)

Member, Planning Committee of International Symposia on Neural Regeneration (2000-)

Member, Organizing Committee for Asia Pacific Symposia on Neural Regeneration (2000-)

Secretary General, International Society of Developmental Neuroscience (2002-)

Director, Rick Hansen Spinal Cord Injury (SCI) National Network (SCI-Net) (2002-)

Grant Selection Committees:

Member, Neuroscience Grant Review Committee, Medical Research Council of Canada (1993-94)

Member, Scientific Advisory Panel, Rick Hansen Man-in-Motion Foundation (1993-96)

Chair, Scientific Advisory Panel, Rick Hansen Man-in-Motion Foundation (1995)

Chair, National Scientific Review Panel, Canadian Provincial Neurotrauma Funds (1997-98)

Member, National Scientific Review Panel, Canadian Provincial Neurotrauma Funds (1999-2000)

Other Public Service:

1981-84 Advisor to CBC "Nature of Things" for TV documentary on spinal cord injury.
First shown on CBC in 1983.

1985-92 Judge, BC Science Fair; 1991: Judge, Canada-wide Science Fair

1989-92 Member, "Scientists in Schools" program, Ministry of Advanced Education, Victoria, BC

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1995-97 Principal Scientific Advisor to Accolade Productions for TV documentary on spinal cord injury (The Toughest Break). First shown on Global TV Network in June 1996.

Research and Professionally Related Scholarly and Creative Activities**Areas of special interest and accomplishment in discipline:**

- 1) Central nervous system development and spinal cord regeneration.
- 2) Central nervous system control of locomotion in vertebrates.

Selected research or equivalent grants received as principal investigator:

Source	Type	Year	\$ Amount
Rick Hansen Institute	Project Grant	2003	\$500,280
BC Neurotrauma Foundation (ICORD Administration)	Operating	2003	\$203,000
John and Penny Ryan BC Leadership Chair (\$6,000,000 capital) awarded 2002	Endowment	ongoing operating	~\$100,000/yr
Canada Foundation for Innovation (for ICORD Centre)	Infrastructure	2002	\$12,880,000
BC Knowledge Development Fund (for ICORD Centre)	Infrastructure	2002	\$12,880,000
BC Neurotrauma Foundation	Operating	2002	\$245,000
BC Neurotrauma Foundation (with Marcel Dvorak)	Operating	2002	\$160,500
BC Neurotrauma Foundation (with Stacy Elliott)	Operating	2002	\$125,000
BC Neurotrauma Foundation (with Janice Eng)	Operating	2002	\$193,000
BC Neurotrauma Foundation (with Peter Soja)	Operating	2002	\$105,000
BC Neurotrauma Foundation (with Kerry Delaney)	Operating	2002	\$105,000
Medical Research Council (MRC)	Operating	1988-90	37,500/yr
MRC	Operating	1990-93	57,000/yr
MRC	Operating	1993-98	94,000/yr
MRC	Operating	1998-2001	98,000/yr
CIHR/CNRP	Operating	2000-2003	\$62,000/yr
CIHR/CNRP	Operating	2000-2001	\$60,000/yr
CIHR/CNRP	Operating	2001-2004	\$61,085/yr
Natural Sciences & Engineering Research Council (NSERC)	Operating	1987-90	35,000/yr
NSERC	Operating	1990-93	35,000/yr
NSERC	Operating	1994-99	32,000/yr
NSERC	Equipment	1990	22,350

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BC Neurotrauma Fund (with Wolfram Tetzlaff)	Operating	1999-2001	60,000/yr
Neuroscience Network	Operating	1993-94	35,000/yr
Neuroscience Network	Operating	1994-98	51,000/yr
Neuroscience Network/PENCE Imgenix Inc.	Collaborative	1996-98	45,000/yr
NSERC Industry Oriented Research (IOR)	Cooperative	1990-92	12,000/yr
World Wildlife Foundation (WWF)/Pulp & Paper Industry	Industrial	1990-92	40,000/yr
BC Ministry of the Environment (MOE) Sustainable Development	Operating	1991-92	28,250/yr
BC MOE	Operating	1992	14,500
BC Spinal Cord Society	Donations	1990	1,500
BC Spinal Cord Society	Donations	1991	20,000
British Columbia Health Research Foundation (BCHRF)	Operating	1990	10,000
BCHRF	Operating	1991	10,850
BCHRF	Operating	1992	16,000
Spinal Cord Research Foundation (SCRF) with Wolfram Tetzlaff	Operating	1997-98	70,000/yr

Summary of Research Interests and Accomplishments:

Vertebrate central nervous system: neural development,
neural repair,
neural control of locomotion.

Over the years I have focused my research on the mechanisms essential to facilitate functional repair after central nervous system (CNS) damage such as occurs with spinal cord and brain injuries. My research utilizes an interdisciplinary approach and the techniques range in scope from the study of voluntary locomotor behavior to the molecular basis of CNS development and function. Each preparation has its own advantages and has been instructive in answering a number of questions. Generally we have concentrated our efforts on understanding and characterizing brainstem-spinal cord injury has drastic consequences. Below is a brief summary of what I currently judge to be some of my more significant accomplishments.

One major accomplishment was the first direct demonstration that reticulospinal pathways (a prominent and phylogenetically old brainstem-spinal pathway) are essential for the initiation of locomotion in all vertebrates (eg, Steeves and Jordan, 1978, Anat. Rec. 190:551; 1980, Neurosci. Lett. 20:283; 1984, Brain Res. 307:263; Steeves et al., 1987, Brain Res. 401:205; Sholomenko and Steeves, 1987, Exp. Neurol. 95:403; Webster and Steeves, 1988, J. Comp. Neurol. 273:573; 1991, J. Comp. Neurol. 312:467; Sholomenko et al., 1991a,b, Exp. Brain Res. 85:659 and 674; 1991c, Neurosci. 40:257; Keirstead et al., 1995, J. Neurosci. 15:6963). Subsequently, we characterized these reticulospinal pathways anatomically, physiologically, and pharmacologically. In short, our work made significant contributions to establishing the now accepted notion that reticulospinal pathways are the final "common" descending pathway for the initiation of locomotion in all vertebrates (i.e. swimming, walking or flying). Having identified and functionally characterized this critical pathway encouraged me to use this CNS system has a "test-bed" for some of my ideas about the fundamental mechanisms underlying CNS development and how we might facilitate CNS repair after injury.

We established the avian embryo as an important animal model that would provide unique insight into some of the mechanisms underlying brainstem-spinal development. These lessons could then be adapted to facilitate repair after an adult CNS injury (Nelson and Steeves, 1987, Soc. Neurosci. Abstr. 13:972; Hasan et al., 1991, Restor. Neurol. Neurosci. 2:137; 1993, J. Neurosci., 13:492-507; Steeves et al., 1993, NeuroProtocols 3:35-44; Keirstead et al., 1995, J. Neurosci. 15:6963). In short, the reasoning was, and still is, that effective CNS regeneration after an adult injury requires the re-capitulation of some of the developmental conditions which initiated accurate CNS development (i.e. generation). Specifically, we were the first to discover that the completely transected spinal cord of a developing vertebrate (e.g. an embryonic chick) will functionally repair all damage if the injury occurs prior to a certain embryonic state. If the transection is made after this stage, the anatomical and functional repair is drastically reduced and resembles the virtually non-existent repair after an injury to an adult bird or mammal. In short, we found a permissive period for spinal cord repair, immediately followed by a restrictive period for repair. The repair process involves "true" regeneration of damaged axons (Hasan et al., 1990, Soc. Neurosci. Abstr. 16:1002; 1993, J. Neurosci., 13:492-507).

More interesting was the discovery that the developmental onset of spinal cord myelination also begins at this developmental transition point (permissive to restrictive repair stages). We were then able to suppress the onset of CNS myelination process using an immunological approach and delay the appearance of myelin within the CNS. If we then transected the spinal cord, of a myelin suppressed animal, during the normally restrictive period for repair, it resulted in 90-100% functional recovery (Keirstead et al., 1992, Proc. Natl. Acad. Sci. USA, 89:11664-11668).

Perhaps more importantly, this was the first demonstration that myelin is inhibitory to **functional** central nervous system (CNS) regeneration and it has generated considerable activity within the scientific community. Subsequently, our findings have been confirmed by other groups using mammalian developmental models (e.g. Norman Saunders in Australia and John Nicholls in Switzerland). We have extended these findings and found that a similar immunological protocol transiently demyelinate the mature avian or mammalian spinal cord and facilitates brainstem-spinal axonal regeneration (up to 20% of injured projections; Keirstead et al., 1995, J. Neurosci. 15:6963-6974, Dyer et al., 1998, Exp. Neurol. 154(1):12-22.).

These findings also enabled us to propose new hypotheses for CNS myelin as a stabilizer of neurodevelopment. In short, the appearance of CNS myelin always occurs after an axon has completed its projections and acquired appropriate targets (never before). This is usually during the latter stages of CNS development (pre- or post-natal) and consolidates the pattern of connections that have been previously established (inhibiting any spontaneous sprouting which would be deleterious to behavior). A consequence of this developmental suppression role is the inhibition of effective regeneration after an adult injury (see Steeves and Keirstead, The Neuroscientist, 1997).

To further elucidate the mechanisms that promote or inhibit spinal repair, we have incorporated molecular/biochemical techniques in our research. For example, we are examining some of the potential roles for programmed cell death and anti-apoptotic therapies during both CNS development and repair. The desire here is to develop strategies that would reduce the amount of neuronal death after a CNS injury. We have used and continue to use gene chip technologies to identify novel genes involved in CNS damage and CNS repair. We can utilize this information to stimulate (i.e. re-activate) specific axonal growth programs within injured CNS neurons.

We have developed unique cell and tissue culture assays for identified CNS neurons with long axonal projections (i.e. brainstem-spinal neurons). This is not a trivial accomplishment; most neuroscientists rely on *in vitro* cultures of immortalized cells or primary cultures of peripheral neurons

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(e.g. dorsal root ganglion cells). Our primary cultures (dissociated or explant) are of CNS neurons of a particular known phenotype. We can generate identified cultures from virtually any CNS region. The combination of a few disparate technologies enabled the desired advance. More importantly, these unique CNS *in vitro* assays have enabled us to more accurately identify which specific factors have a potential therapeutic benefit for facilitating *in vivo* regeneration after an adult injury (just as importantly, it allows us to eliminate those factors which are unlikely to be of benefit).

For further information, please consult the ICORD web site at www.icord.org

Patents have and continue to be filed on discoveries that have the potential to be translated into clinical therapies. A spin-off company, Neuro Therapeutics Inc. (NTI) was created in 2000. NTI has been provided initial seed funding of approximately \$500,000 per year for the first 2 years. NTI has concluded a joint (50/50) partnership agreement with Medarex Inc. of the United States to co-develop several of NTI's licensed technologies.

For further information, please consult the NTI web site at <http://neurotherapeutics.com>

Other relevant Information**Graduate Student Theses supervised:**

- | | Completed | M.Sc. = 7 | Ph.D. = 10 |
|------|---|-----------|------------|
| 1983 | Derek Emery - Characterization of a reduced-eye mutant of the grasshopper, <i>Melanophus sanguinipes</i> . M.Sc. Thesis. Currently in private practice as a physician. | | |
| 1984 | Gerald Sholomenko - Brainstem and spinal cord pathways involved in the control of avian locomotion. M.Sc. Thesis. | | |
| 1989 | Gerald Sholomenko - Studies in the neural control of avian locomotion. Ph.D. Thesis. Postdoctoral Fellow (1989-92) with Drs. R. Burke and M. O'Donovan at NIH; research associate (1992-94) with Dr. K. Delaney at Simon Fraser University; currently a high school teacher in Vernon, BC. | | |
| 1989 | Deirdre Webster - Avian brainstem and descending spinal projections associated with locomotion. Ph.D. Thesis. Postdoctoral Fellow (1990); Assistant Professor (1991-95) in School of Rehab. Medicine, UBC; currently in private Physiotherapy practice. | | |
| 1990 | Gregory Funk - Locomotor-respiratory synchrony in the Canada Goose. Ph.D. Thesis (co-supervised with Dr. W.K. Milsom). Postdoctoral Fellow (1990-94) with Dr. J. Feldman at UCLA; currently a Senior Lecturer (1995-) in the Department of Physiology at the University of Auckland in New Zealand. | | |
| 1991 | Douglas Ethell - Analysis of developing chick, <i>Gallus domesticus</i> , spinal cord proteins using two dimensional gel electrophoresis. M.Sc. Thesis. | | |
| 1992 | David Pataky - Growth associated messenger ribonucleic acid expression in a model of successful embryonic central nervous system regeneration. M.Sc. Thesis. | | |
| 1992 | Sohail Hasan - Axonal regeneration and functional recovery in the chick following embryonic spinal cord injury. Ph.D. Thesis. Postdoctoral Fellow (1992-94) with Dr. M. Schwab at University of Zurich; | | |

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medical student (1994-98) at the University of Toronto. Currently an Ophthalmology resident at the University of Toronto.

- 1993 **Douglas Ethell** - Neurite inhibitors from the developing and mature spinal cord. **Ph.D.** Thesis. Postdoctoral Fellow 1993-96) with Dr. Y.-A. Barde at Max Planck Institute for Psychiatry, Martinsried (Munich), Germany; currently Research Associate with Scripps Institute, La Jolla, California.
- 1994 **Hans Keirstead** - Immunological suppression of central nervous system (CNS) myelin and the effect of myelin suppression on CNS repair after injury. **Ph.D.** Thesis. Postdoctoral Fellow (1995-99) with Dr. W. Blakemore at Cambridge University (also a Lecturer and Full Fellow at Downing College, Cambridge). ICORD Research Associate (1999-2000). Currently an Assistant Professor at the University of California at Irvine.
- 1996 **Gillian Muir** - Biomechanics of locomotion and locomotor recovery after incomplete spinal cord injuries in the hatchling chick. **Ph.D.** Thesis. Postdoctoral Fellow (1995-96) with Dr. Ian Whishaw at University of Lethbridge. Currently Associate Professor in the Department of Veterinary Physiology at the University of Saskatchewan in Saskatoon (1996-).
- 1998 **Christine Tarazi** - Nerve root avulsion in the adult rat followed by the delayed implantation of a peripheral nerve graft into the spinal cord: effects on motoneuron survival and regeneration. **M.Sc.** Thesis. Currently living in Oklahoma City.
- 2000 **David Pataky** - In vitro characterization of influence of specific growth factors on identified populations of brainstem-spinal neurons. **Ph.D.** Thesis. Currently the owner of a computer consulting business in Vancouver.
- 2000 **Christopher McBride** - Cell death in the injured developing spinal cord, a model for adult CNS injury. **Ph.D.** Thesis.
- 2000 **Jason Bourque** - Role of complement in the immunological demyelination of the adult rat spinal cord. **M.Sc.** Thesis. Currently a medical student at the University of Toronto.
- 2001 **Rishard Salie** - The effect of growth factors on bulbospinal neurite outgrowth in an in vitro embryonic chick model. **M.Sc.** Thesis. Currently a PhD student in Basel, Switzerland.
- 2002 **Jaimie Borisoff** - Intrinsic Neuronal Determinants of Neurite Regrowth. **Ph.D.** Thesis. Currently a Neural Engineer, The Brain Interface Lab at the Neil Squire Foundation and Post-Doctoral Fellow, the Ramer Lab at ICORD.

Current Graduate Students**Ph.D.**

- Ward Plunet** supported by an NSERC Studentship (1997-)
- John McGraw** supported by Neuroscience Network (1995-98);
Neurotrauma Fund Studentship (1998-)
- Loren Oshipok** supported by MRC/CIHR Studentship

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MSc

Leanne Lewis – Olfactory Ensheathing Cells in the Injured Spinal Cord. Co-supervising with Dr. Wolfram Tetzlaff.

Other Research Personnel Supervised:*Postdoctoral Fellows/Research Associates:***Former -**

Dr. Michael Politis - (1987-88); U. Saskatchewan Veterinary School (1990-94); currently in private veterinary medical practice.

Dr. Deirdre Webster (Ph.D., 1989, UBC), 1989-90; subsequently Assistant Professor in School of Rehab. Med. (1991-95), UBC; currently in private physiotherapy practice.

Dr. Diane Henshel - (Ph.D., 1987, Washington Univ., St. Louis, Missouri), 1989-92; currently Assistant Professor in the School of Public and Environmental Affairs (SPEA) at the University of Indiana.

Dr. Thomas Zwimpfer - (M.D., 1983, U. Toronto; Ph.D., 1991, McGill), 1992-94; MRC Clinical Scientist (1992-94); currently Assistant Professor (1992-) in the Dept. of Surgery (Division of Neurosurgery, UBC).

Dr. Michael Rott - (Ph.D., 1992, UBC), 1992-95; Rick Hansen Man in Motion Fellowship (1992-94) and Neuroscience Network Fellow (1994-95); currently Research Assistant Professor (1995-) with Dr. M. Bahr at Max Planck Institute, Tubingen, Germany.

Dr. Claire Huguenot - (Ph.D., 1989, Strasbourg), 1995-98; currently a research Associate with Dr. Wolfram Tetzlaff of ICORD

Dr. Hans Keirstead - (Ph.D., 1994, British Columbia), 1999-2000; NRC IRAP Operating Grant 1999-2001; National Rick Hansen Neurotrauma Initiative Operating and Salary Grants, 1999-2001; Currently an Assistant Professor at the University of California, Irvine.

Dr. Jason Dyer - (Ph.D., 1993, U. Bristol), 1993-94; R. Hansen Man in Motion Fellowship (1994-8) and Neuroscience Network Fellow (1994-98); Neurotrauma Fund Research Associate (1998-). Currently Chief Scientific Officer of Neurotherapeutics Inc., an ICORD spin-off company.

Dr. Gordon Hiebert - (Ph.D., 1996, Alberta), 1996-2002; Rick Hansen Man in Motion Fellowship (1996-97); MRC Fellowship (1997-99), co-supervised with Dr. W. Tetzlaff. Currently a Research Associate at University of Alberta.

Dr. Chris McBride - (Ph.D., 2000, UBC), 2000-2002 ; Post Doctoral Research Fellow with Dr. Wolfram Tetzlaff at UBC. Currently managing Director and Associate Director of Communications and Training for ICORD.

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2. Jordan, LM, McCrea, DA, Steeves, JD, Menzies, JM. 1977. Noradrenergic synapses and effects of noradrenaline on interneurons in the ventral horn of the cat spinal cord. *Canadian Journal of Physiology and Pharmacology* 55:399-412.
3. Steeves, JD, Schmidt, BJ, Skovgaard, BJ, Jordan, LM. 1980. Effect of noradrenaline and 5-hydroxytryptamine depletion on locomotion in the cat. *Brain Research* 185:349-362.
4. Steeves, JD, Jordan, LM. 1980. Localization of a descending pathway in the spinal cord which is necessary for controlled treadmill locomotion. *Neuroscience Letters* 20:283-288.
5. Pearson, KG, Heitler, WJ, Steeves, JD. 1980. Triggering of locust jump by multimodal inhibitory interneurons. *Journal of Neurophysiology* 43:257-278.
6. Steeves, JD, Pearson, KG. 1982. Proprioceptive gating of inhibitory pathways to hindleg flexor motoneurons in the locust. *Journal of Comparative Physiology* 146:507-515.
7. Akazawa, K, Aldridge, JW, Steeves, JD, and Stein, RB. 1982. Modulation of stretch reflexes during locomotion in the mesencephalic cat. *Journal of Physiology* 329:553-567.
8. Steeves, JD, Pearson, KG. 1983. Variability in the structure of an identified interneurone in siogenic clones of locusts. *Journal of Experimental Biology* 103:47-54.
9. Gosline, JM, Steeves, JD, Harman, AD, Demont, ME. 1983. Patterns of circular and radial muscle activity in respiration and jetting of the squid. *Journal of Experimental Biology* 104:97-110.
10. Loer, CM, Steeves, JD, Goodman, CS. 1983. Variable patterns of neuronal cell death in grasshopper embryos from different clones, clutches and species. *Journal of Embryology and Experimental Morphology* 78:169-182.
11. Steeves, JD, Jordan, LM. 1984. Autoradiographic demonstration of the projections from the mesencephalic locomotor region. *Brain Research* 307:263-276.
12. Emery, DJ, Bell, KA, Chapco, W, Steeves, JD. 1984. Characterization of a reduced-eye mutant of the grasshopper, *Melanoplus sanguinipes*. *Journal of Embryology and Experimental Morphology* 83:189-211.
13. Weinstein (Sholomenko), GN, Anderson, C, Steeves, JD. 1984. Functional characterization of limb muscles involved in locomotion of the Canada goose, *Branta canadensis*. *Canadian Journal of Zoology* 62:1596-1604.
14. Nichols, TR, Steeves, JD. 1986. Resetting of resultant muscle stiffness in ankle flexor and extensor muscles in the decerebrate cat. *Experimental Brain Research* 62:401-410.
15. Steeves, JD, Sholomenko, GN, Webster, DMS. 1987. Stimulation of the pontomedullary reticular formation initiates locomotion in decerebrate birds. *Brain Research* 401:205-212.

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17. Steeves, JD, Taccogna, CA, Bell, KA, Vincent, SR. 1987. Distribution of phenylethanolamine-n-methyltransferase (PNMT) immunoreactive neurons in the avian medulla oblongata. *Neuroscience Letters* 76:7-12.
18. Webster, DMS, Steeves, JD. 1988. Origins of brainstem-spinal projections in the duck and goose. *Journal of Comparative Neurology* 273:573-583.
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22. Valenzuela, JJ, Hasan, SJ, Steeves, JD. 1990. Stimulation of the pontomedullary reticular formation initiates locomotion in embryonic chicks *in ovo*. *Developmental Brain Research* 56:13-18.
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Refereed Review Articles and Book Chapters:

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2. Steeves, JD, Sholomenko, GN, Webster, DMS. 1986. Reticular formation stimulation evokes walking and flying in birds. In: Grillner, G, Stein, PSG, Stuart, DG, Forssberg, H, Herman, RM, Wallin, P, editors. *Neurobiology of Vertebrate Locomotion*. Hampshire: McMillan. p 51-54.
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4. Henshel, DS, Hehn, B, Vo, MT, Steeves, JD. 1993. A short term test for dioxin teratogenicity using chicken embryos. In: Gorsuch, FJ, Dwyer, CA, editors. *Second Symposium of Environmental Toxicology and Risk Assessment (ASTM #1216)*. Philadelphia: Ingersoll & T.W. LaPoint. p 159-174.
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Selected Published Abstracts (total published >250)

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1. Jordan, LM, Steeves, JD. 1975. Effect of 6-hydroxydopamine pretreatment on locomotion in the mesencephalic cat. *Society for Neuroscience Abstracts* 1:635.
2. Steeves, JD, Jordan, LM. 1978. Autoradiographic demonstration of brainstem and spinal projections of the mesencephalic locomotor region in the cat. *The Anatomical Record* 190:551.
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Patents

1. Steeves JD, Dyer J, Keirstead H. Immunological Composition and Its Method of Use to Transiently Disrupt Mammalian Central Nervous System Myelin to Promote Neuronal Regeneration. U.S. Patent No. 6,548,061
2. Steeves JD, Keirstead H, Dyer JK and Bourque J. 1999. Composition for neuronal regeneration. (filed in Canada and USA, filed under PCT in Europe, Israel, Australia, New Zealand, Japan, USA, South Africa).

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Conference Communications (>250)

Not listed